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THE NATH LAW GROUP
112 South West Street
Alexandria, VA 22314

EXAMINER	
BENNETT, JENNIFER D	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,611	MCSTAY ET AL.	
	Examiner	Art Unit	
	JENNIFER BENNETT	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-6,8,9,12,18,20-35,37 and 39-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6,8,9,12,18,20-35,37 and 39-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to amendments and remarks filed July 8, 2010. Claims 1, 4-6, 8, 9, 12, 16, 18, 20-35, 37, and 39-45 are currently pending.

Claim Objections

1. Claims 32-34 are objected to because of the following informalities:

Re claims 32-34, the limitation "during use and/or though" should be --during use and/or through--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4-6, 12, 16, 18, 20, 23, 27-30, 39-42, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) in view of Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379).

Re claims 1 and 45: Correa teaches a fluorometer (fig. 2, 4, 6) for detecting the level of fluorescent material in a body of water (col. 7, lines 45-49), the fluorometer comprising: an excitation system (76) including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (abstract); and a detection system (106, 212, 222, 224, fig. 4 and 6) for detecting said fluorescence (col.

7, lines 45-49), wherein said excitation system comprises an excitation source comprising one or more laser (see fig. 4 and 6), the excitation system further comprising means to cause said excitation light to form, in use, a generally conical divergent beam projecting from the fluorometer (see fig. 6), said beam causing means comprising at least one collimating lens (172) said excitation system further including means for modulating (170) said beam with a modulating signal having a modulating frequency (col. 10, lines 31-46), and wherein said detection system (106, 212, 222, 224, fig. 4 and 6) comprises means for receiving light and for converting said received light into a corresponding electrical signal (photomultipliers receive light and convert it into an electric signal), and at least one lens (104, 102, 204) arranged to direct said received light onto said light receiving and converting means, wherein said at least one lens of the detection system is arranged to provide a generally conical convergent detection volume for the detection system (see fig. 4 and 6), said generally conical detection volume converging in a direction towards said fluorometer and at least partially overlapping with said generally conical divergent beam (see fig. 6, the beam expander spreads the beam from the laser which is then scanned, the beam excites the material in the water, which then fluoresces back to the detector) and wherein said detection system further includes means for detecting, in the electrical signal produced by said light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency (col. 10, lines 31-46), said detecting means including means for performing analysis of said electrical signal and means for determining the value of a spectral component of said electrical signal corresponding to

said modulation frequency (col. 8, lines 56-68, col. 9, lines 1-67, and col. 10, lines 1-54), wherein said detection system is arranged to determine the level of fluorescent material present in said body of water depending on said value of said spectral component, such that the fluorometer is capable of detecting fluorescent material located remotely from the fluorometer in said body of water (col. 7, lines 34-49). Correa does not specifically teach the use of LEDs or that the signal detected by the detection system is processed by spectral analysis. One of ordinary skill in the art would have used LEDs in order to reduce the cost of the device and by using a spectral analysis of the information captured by the detection device in order to more accurately type of fluorescent material being measured. As further evidenced by Barringer, who teaches a remote detection of hydrocarbon seeps (abstract, fig. 1 and 2), comprising: a detection unit (26) which uses spectral analysis to more accurately detect hydrocarbon seeps under water (see fig. 1 and col. 1, lines 36-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use spectral analysis similar to Barringer with the fluorometer of Correa in order to ensure the proper detection of certain materials in the water making it easier to find the locations of the materials source under water. Correa as modified by Barringer do not teach the use of LEDs as the excitation source. Tokhtuev teaches a fluorometer (abstract, fig. 1-3) comprising an excitation system including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (paragraph 13); and a detection system for detecting said fluorescence (paragraph 14, lines 2-3), wherein said excitation system comprises an excitation source comprising one or more light emitting diodes (LEDs)

(paragraph 14, lines 3-4). It would have been obvious to one of ordinary skill in the art to use LEDs as the excitation light source in order to provide a light source that is cheaper to make and maintain which would reduce the cost of the device.

Re claim 4: Correa as modified by Barringer and Tokhtuev teaches a fluorometer (Correa, see fig. 6), wherein said excitation system comprises an excitation source comprising one or more light emitting diodes (Correa, 76), the excitation system further comprising means to cause said excitation light to form, in use, a generally conical divergent beam projecting from the fluorometer (Correa, see fig. 6 the beam is cone shape), said beam causing means comprising at least one lens (Correa, 172). Correa as modified by Barringer and Tokhtuev does not specifically teach wherein said excitation source is located substantially at the focal point of the nearest to the excitation source of said at least one lens. It is well known in the art or anyone who deals with optics that if the light source is at the focal point of a collimator and the beams from the light source are diverging outward from the light source that the combination would create a collimated beam. The collimated beam would not be a perfect collimated beam there may be some slight divergence of convergence because of the imperfection in the lens piece. One of ordinary skill in the art would have understood in order to get a nice spread of the beam with the light source at the focal point of the collimator one would have to use another lens, preferably a diverging lens piece, which would spread the beam of light to create a diverging beam. Since, Correa as modified by Barringer and Tokhtuev already teaches a diverging beam and an optic system to create and control the divergence of the beam (see fig. 6 with element 172), it

would have been obvious to one of ordinary skill to use the appropriate lens set up in the system to provide for better control of the beam and a sufficient enough spread in the beam to cover a proper amount of area at a remote location form the detection system.

Re claim 5: Correa as modified by Barringer and Tokhtuev a fluorometer as, wherein said excitation system includes a collimator (172) for forming said generally conical divergent beam (the beam expander is known to spread (diverge) and form a collimated beam).

Re claim 6: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, comprising a plurality of LEDs arranged in a one dimensional rectangular array (Tokhtuev, see fig. 3, the two LEDs 27 are in a row therefore one dimensional and generally rectangular, to optimize illumination of the target region being analyzed by increasing the illumination area or illuminating the target with different wavelengths of light in order to produce optimal results of the area being studied).

Re claim 12: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said light receiving and converting means comprises a photodetector (Correa, photomultipliers are photodetectors, see fig. 6-8).

Re claim 16: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said light receiving and converting means is located substantially at the focal point of the nearest to said light receiving and converting means of said at least one lens (Correa, col. 5, lines 13-20, see fig. 8).

Re claim 18: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said detecting means is arranged to detect, in the electrical signal produced by said light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency and substantially in phase with the modulation of said beam (Correa, col. 10, lines 31-54).

Re claim 20: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein the excitation system (Correa, 76) and the detection system (106) are each provided in a respective housing (each are located in their respective housing surrounded by 50, see fig. 4), the respective housings being located adjacent one another and arranged such that there is an overlap, during use, between said generally conical divergent beam emanating from the excitation system housing and said generally conical convergent detection volume of the detection system housing (as seen in fig. 4 the conical beams overlap and the respective housing are adjacent to each other).

Re claim 23: Correa as modified by Barringer and Tokhtuev a fluorometer, wherein the excitation system (76) and the detection system (106) are located in a common housing (see fig. 4).

Re claim 27: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said common housing (Correa, 50) comprises a window (Correa, 60) and at least two inner chambers (the detectors are one chamber and the laser is in the other chamber, Correa, see fig. 6), at least part of the excitation system being located in a first inner chamber and at least part of the detection system being located in

a second inner chamber (Correa, see fig. 6), said at least part of the excitation system being arranged so that said beam is projected, during use, out of the housing through said window (60) (Correa, see fig. 6), said second inner chamber being located beyond said first inner chamber with respect to said window (Correa, see fig. 4 and 6), said at least part of the detection system facing towards said window, and wherein a reflecting system (102) is located between the first and second inner chambers and is arranged to direct light entering, during use, said housing through said window onto said detection system (Correa, see fig. 4 and 6).

Re claim 28: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said reflecting system (Correa, 102) (fig. 7) comprises a first reflecting surface (concave portion after 92) facing towards said window (60) (Correa, fig. 4) and a second reflecting surface (92) facing away from said window (60) (Correa, see fig. 4 and 7), the first reflecting surface being arranged to direct light entering, during use, said housing through said window onto said second reflecting surface, said second reflecting surface being arranged to direct said light onto said detection system (Correa, See fig. 4 and 7).

Re claim 29: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said first reflecting surface is shaped to define an aperture (there is an aperture to let the light through see fig. 7. Correa), said detection system being positioned to receive light from said second reflecting surface through said aperture (Correa, see fig. 7).

Re claim 30: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said reflecting system comprises a Cassegrainian mirror system (Correa, see fig. 7, element 102 is a Cassegrainian system, 92 and the concave mirror with an aperture).

Re claim 39: Correa as modified by Barringer and Tokhtuev a fluorometer, wherein said excitation system is arranged such that said beam is capable of causing fluorescence in fluorescent material at distances of up to several meters from the fluorometer (Correa, see fig. 1 the fluorometer can detect fluorescence at large distances).

Re claim 40: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said excitation system is arranged such that said beam is capable of causing fluorescence in fluorescent material at distances of between 1 and 15 meters from the fluorometer (Correa, col. 4, lines 6-9).

Re claim 41: Correa as modified by Barringer and Tokhtuev a fluorometer (Correa, fig. 4, 6, 7 and 8), wherein the respective housings have a respective longitudinal axis (each are located in their respective housing surrounded by 50, see fig. 4, ach one would have a longitudinal axis), said longitudinal axes being substantially parallel with one another (the longitudinal axis of each housing is parallel to the output beam through the window 60), and said generally conical divergent beam and said generally conical convergent detection volume are substantially aligned with said respective longitudinal axis (Correa, based on the description of the longitudinal axis

then the conical divergent and convergent beams are substantially aligned with the longitudinal portions of the housings, see fig. 4).

Re claim 42: Correa teaches a fluorometer (fig. 2, 4, 6) for detecting the level of fluorescent material in a body of water (col. 7, lines 45-49), the fluorometer comprising: an excitation system (76) including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (abstract); and a detection system (106, 212, 222, 224, fig. 4 and 6) for detecting said fluorescence (col. 7, lines 45-49, wherein said excitation system comprises an excitation source comprising one or more laser (see fig. 4 and 6), the excitation system further comprising means for causing said excitation light to form, in use, a generally conical divergent beam projecting from the fluorometer (see fig. 6), said beam causing means comprising at least one collimating lens (172) arranged to cause said excitation light to form a substantially collimated elongate beam that projects, during use, from the fluorometer (see fig. 4, the beam expander creates a divergent collimated beam), and said excitation system further including means for modulating (170) said collimated elongate beam with a modulating signal having a modulating frequency (col. 10, lines 31-46), said excitation system being arranged such that said beam is capable of causing fluorescence in fluorescent material at distances of up to several meters from the fluorometer (Correa, see fig. 1 the fluorometer can detect fluorescence at large distances, col. 4, lines 6-9), and wherein said detection system (106, 212, 222, 224, fig. 4 and 6) comprises means for receiving light and for converting said received light into a corresponding electrical signal (photomultipliers receive light and convert it into an

electric signal), and at least one lens (104, 102, 204) arranged to direct said received light onto said light receiving and converting means, wherein said at least one lens of the detection system is arranged to provide a generally conical convergent detection volume for the detection system (see fig. 4 and 6), said generally conical detection volume converging in a direction towards said fluorometer and at least partially overlapping with said generally conical divergent beam (see fig. 6, the beam expander spreads the beam from the laser which is then scanned, the beam excites the material in the water, which then fluoresces back to the detector), and wherein said detection system further includes means for detecting, in the electrical signal produced by said light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency (col. 10, lines 31-46), said detecting means including means for performing analysis of said electrical signal and means for determining the value of a spectral component of said electrical signal corresponding to said modulation frequency (col. 8, lines 56-68, col. 9, lines 1-67, and col. 10, lines 1-54), wherein said detection system is arranged to determine the level of fluorescent material present in said body of water (col. 7, lines 34-49) depending on said value of said spectral component such that the fluorometer is capable of detecting fluorescent material located remotely from the fluorometer at distances of up to several meters from the fluorometer in said body of water (see fig. 1 the fluorometer can detect fluorescence at large distances, col. 4, lines 6-9), wherein the excitation system (Correa, 76) and the detection system (106) are each provided in a respective housing (each are located in their respective housing surrounded by 50, see fig. 4), the respective housings being

located adjacent one another and arranged such that there is an overlap, during use, between said generally conical divergent beam emanating from the excitation system housing and said generally conical convergent detection volume of the detection system housing (as seen in fig. 4 the conical beams overlap and the respective housing are adjacent to each other), and wherein the respective housings have a respective longitudinal axis (each are located in their respective housing surrounded by 50, see fig. 4, ach one would have a longitudinal axis), said longitudinal axes being substantially parallel with one another (the longitudinal axis of each housing is parallel to the output beam through the window 60), and said generally conical divergent beam and said generally conical convergent detection volume are substantially aligned with said respective longitudinal axis (Correa, based on the description of the longitudinal axis then the conical divergent and convergent beams are substantially aligned with the longitudinal portions of the housings, see fig. 4). Correa does not specifically teach the use of LEDs or that the signal detected by the detection system is processed by spectral analysis. One of ordinary skill in the art would have used LEDs in order to reduce the cost of the device and by using a spectral analysis of the information captured by the detection device in order to more accurately type of fluorescent material being measured. As further evidenced by Barringer, who teaches a remote detection of hydrocarbon seeps (abstract, fig. 1 and 2), comprising: a detection unit (26) which uses spectral analysis to more accurately detect hydrocarbon seeps under water (see fig. 1 and col. 1, lines 36-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use spectral analysis similar to Barringer with the

fluorometer of Correa in order to ensure the proper detection of certain materials in the water making it easier to find the locations of the materials source under water. Correa as modified by Barringer do not teach the use of LEDs as the excitation source. Tokhtuev teaches a fluorometer (abstract, fig. 1-3) comprising an excitation system including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (paragraph 13); and a detection system for detecting said fluorescence (paragraph 14, lines 2-3), wherein said excitation system comprises an excitation source comprising one or more light emitting diodes (LEDs) (paragraph 14, lines 3-4). It would have been obvious to one of ordinary skill in the art to use LEDs as the excitation light source in order to provide a light source that is cheaper to make and maintain which would reduce the cost of the device.

Re claim 44: Correa as modified by Barringer and Tokhtuev a fluorometer, provided on an underwater vehicle (Correa, see fig. 1).

2. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379) as applied to claim 1 above, and further in view of Bentsen et al. (US 6372895).

Re claim 8: Correa as modified by Barringer and Tokhtuev teaches fluorometer comprising an excitation system (Correa, 76) including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (abstract) said excitation system further including means for modulating (170) said

beam with a modulating signal having a modulating frequency (Correa, col. 10, lines 31-46). Correa as modified by Barringer and Tokhtuev does not specifically teach wherein said modulating means is arranged to amplitude modulate said beam. Bensten teaches a fluorometer (Bentsen, fig. lb), wherein said modulating means is arranged to amplitude modulate said beam (Bentsen, col. 24, lines 55-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to amplitude modulate the beam of Correa as modified by Barringer and Tokhtuev as in Bensten in order to provide a detection system that detects only signals that correspond to the modulated signal and exclude the influence from random factors and disturbances.

Re claim 9: Correa as modified by Barringer, Tokhtuev and Bentsen teaches a fluorometer (Bentsen, fig. lb), wherein said modulating means is arranged to modulates said beam by adjusting the power supply of the excitation source in accordance with said modulating signal (Bentsen, col. 24, lines 65-67 and col. 25, lines 1-3).

3. Claims 21, 22, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379) as applied to claims 20 and 42 above, and further in view of Frungel et al. (US 3666945).

Re claims 21 and 43: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein the excitation system (Correa, 76) and the detection system (106) are each provided in a respective housing (each are located in their respective housing

surrounded by 50, see fig. 4), the respective housings being located adjacent one another and arranged such that there is an overlap, during use, between said generally conical divergent beam emanating from the excitation system housing and said generally conical convergent detection volume of the detection system housing (as seen in fig. 4 the conical beams overlap and the respective housing are adjacent to each other). Correa as modified by Barringer and Tokhtuev does not teach a fluorometer, wherein the respective housings are adjustably interconnected so that the relative angular disposition between the respective housings may be altered such that the distance of said overlap from said respective housings is altered. One of ordinary skill in the art would have made the houses separable and adjustable in order to create a larger area to be read and reducing the amount of optics used in the system reducing any error caused by the optics and making the device smaller. As further evidenced by Frungel, who teaches a fluorometer (fig. 1 and 2), wherein the respective housings (one for the light source the other for the photo sensor) are adjustably interconnected (supporting pivots, are attached to a support col. 8, lines 20-22, the housing are interconnected to each other through the support and supporting pivots) so that the relative angular disposition between the respective housings may be altered such that the distance of said overlap from said respective housings is altered (col. 5, lines 72-74, see fig. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to be able to move the different housings of Correa as modified by Barringer and Tokhtuev similar to Frungel in order to control where the beam is headed and make sure that it is aligned properly for concise measurements and providing for a

larger area to be measured, while reducing the amount of optics used in the system reducing any error caused by the optics and making the device smaller.

Re claim 22: Correa as modified by Barringer, Tokhtuev and Frungel teaches a fluorometer (Frungel, fig. 2), wherein the respective housings lie generally in a common plane (Correa, see fig. 4), the relative angular disposition of the housings being alterable about an axis that is substantially perpendicular to said plane (Frungel, see fig. 2 the houses are rotated around a perpendicular axis to the plane in which they lie).

4. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379) as applied to claim 23 above, and further in view of Kolber et al. (US 6121053).

Re claim 24: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said common housing (Correa, 50) comprises a window (60) and at least one inner chamber (see fig. 4), at least part of the excitation system and at least part of the detection system being located in said at least one inner chamber (Correa, the inner chamber contains the excitation source and the detector source, see fig. 4), said at least part of the excitation system being arranged so that said beam is projected, during use, out of the housing through said window (Correa, the beam is projected through 60, see fig. 4), said at least part of the detection system facing away from said window (Correa, the detection system 106 is facing away from the window, see fig. 4), and wherein a reflecting surface (102) is located inside the housing facing said window

with respect to said window (see fig. 4, 6-8), said reflecting surface being arranged to direct light entering, during use, said housing through said window onto said detection system (Correa, see fig. 4, 6-8). Correa as modified by Barringer and Tokhtuev does not teach the reflecting surface is beyond the detection system with respect to said window. Kolber teaches a fluorometer wherein said common housing (see fig. 5J, the elements would be contained in a housing) comprises a window (where the light is emitted and fluorescence collected) and at least one inner chamber (the area where the detector 63 and the mirror 62 are located), at least part of the detection system (63) being located in said at least one inner chamber (the area where the detector 63 and the mirror 62 are located), said at least part of the detection system facing away from said window (element 63 is facing away from the window), and wherein a reflecting surface (62) is located inside the housing facing said window (62 is facing the window) and beyond the detection system with respect to said window (the reflecting surface is beyond 63 sensor), said reflecting surface being arranged to direct light entering, during use, said housing through said window onto said detection system (62 directs light to the detection system 63). It would have been obvious to one of ordinary skill in the art to use the detection and mirror system in Kolber with the fluorometer of Correa as modified by Barringer and Tokhtuev in order to place the light source and detector where ever needed inside the housing to reduce size or cost or change the locations depending on the type of measurement needed.

Re claim 25: Correa as modified by Barringer, Tokhtuev and Kolber teaches a fluorometer, wherein said at least part of the excitation system and said at least part of

the detection system are located substantially co-axially with one another within said housing (Kolber, see fig. 5J).

Re claim 26: Correa as modified by Barringer, Tokhtuev and Kolber teaches a fluorometer, in which said at least one inner chamber (there would be at least one inner chamber to contain either the light emitting and detecting component) is located substantially on the longitudinal axis of said housing (Kolber, the area where the detector 63 and the mirror 62 are located, see fig. 5J).

5. Claims 31 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379) as applied to claim 1 and 18 above, and further in view of Chudnovsky (US 6157033).

Re claim 31: Correa as modified by Barringer and Tokhtuev teaches a fluorometer (Correa, fig. 2, 4, 6) for detecting the level of fluorescent material in a body of water (Correa, col. 7, lines 45-49), the fluorometer comprising: an excitation system (76) including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (Correa, abstract); and a detection system (106, 212, 222, 224, fig. 4 and 6) for detecting said fluorescence (Correa, col. 7, lines 45-49), wherein said excitation system comprises an excitation source comprising one or more laser (see fig. 4 and 6), the excitation system further comprising means to cause said excitation light to form, in use, a generally conical divergent beam projecting from the fluorometer (Correa, see fig. 6), said beam causing means comprising at least one

collimating lens (172) said excitation system further including means for modulating (170) said beam with a modulating signal having a modulating frequency (Correa, col. 10, lines 31-46), and wherein said detection system (Correa, 106, 212, 222, 224, fig. 4 and 6) comprises means for receiving light and for converting said received light into a corresponding electrical signal (Correa, photomultipliers receive light and convert it into an electric signal). Correa as modified by Barringer and Tokhtuev does not teach a fluorometer, further including a laser device carried by the fluorometer and positioned to project, during use, a laser beam in a direction generally parallel, or aligned, with the excitation beam. Chudnovsky teaches a leak detection system (fig. 1), further including a laser device (12) carried by the fluorometer and positioned to project, during use, a laser beam in a direction generally parallel, or aligned, with the excitation beam (col. 3, lines 18-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the laser pointer of Chudnovsky with the fluorometer of Correa as modified by Barringer and Tokhtuev in order to direct the excitation beam to certain locations for precision measurements.

Re claim 35: Correa as modified by Barringer and Tokhtuev teaches a fluorometer, wherein said detecting means is arranged to detect, in the electrical signal produced by said light receiving and converting means, a signal component of substantially the same frequency as said modulation frequency and substantially in phase with the modulation of said beam (Correa, col. 10, lines 31-54). Correa as modified by Barringer and Tokhtuev does not teach a means for generating an alarm. Chudnovsky teaches a leak detection system (fig. 1), further including means for

determining the intensity of said signal component, and means for generating an alarm when said intensity exceeds a threshold (col. 2 and 3, lines 66-67 and lines 1-29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the alarm of Chudnovsky with the fluorometer device of as modified by Barringer and Tokhtuev in order to have a way of communicating results or information found by the device to the user operating the device.

6. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379) as applied to claim 1 above, and further in view of Field (US 20050174793).

Re claim 32: Correa as modified by Barringer and Tokhtuev teaches a fluorometer (Correa, fig. 2, 4, 6) for detecting the level of fluorescent material in a body of water (Correa, col. 7, lines 45-49), the fluorometer comprising: an excitation system (76) including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (abstract); and a detection system (106, 212, 222, 224, fig. 4 and 6) for detecting said fluorescence (col. 7, lines 45-49), wherein said excitation system comprises an excitation source comprising one or more laser (see fig. 4 and 6), the excitation system further comprising means to cause said excitation light to form, in use, a generally conical divergent beam projecting from the fluorometer (see fig. 6), said beam causing means comprising at least one collimating lens (172) said excitation system further including means for modulating (170) said beam with a modulating signal having a modulating frequency (Correa, col. 10, lines 31-46). Correa

as modified by Barringer and Tokhtuev does not teach wherein said excitation source is slidably moveable towards and away from the window of the housing in which it is located. Field teaches a light source device (fig. 1 and 2), wherein a light source (18) is slidably moveable towards and away from the window (16) of the housing (10) in which it is located (see fig. 1 and 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a moveable light source as in Field with the fluorometer of Correa as modified by Barringer and Tokhtuev in order to control how the beam passes through the window area, whether as a collimated beam or a diverging beam over an area, dependent on the type of measurement needed.

7. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379) as applied to claim 1 above, and further in view of Zielke et al. (US 3554653).

Re claim 33: Correa as modified by Barringer and Tokhtuev teaches a fluorometer (Correa, fig. 2, 4, 6) for detecting the level of fluorescent material in a body of water (Correa, col. 7, lines 45-49), the fluorometer comprising: an excitation system (76) including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (abstract); and a detection system (106, 212, 222, 224, fig. 4 and 6) for detecting said fluorescence (col. 7, lines 45-49), wherein said excitation system comprises an excitation source comprising one or more laser (see fig. 4 and 6), the excitation system further comprising means to cause said excitation light

to form, in use, a generally conical divergent beam projecting from the fluorometer (see fig. 6), said beam causing means comprising at least one collimating lens (172) said excitation system further including means for modulating (170) said beam with a modulating signal having a modulating frequency (Correa, col. 10, lines 31-46). Correa as modified by Barringer and Tokhtuev does not teach wherein at least one lens of said lens system is slidably moveable towards and away from the window of the housing in which it is located. Zielke teaches an autocollimator (fig. 1), wherein at least one lens (7) of said lens system is slidably moveable towards and away from the window (lens 2) of the housing in which it is located (see fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the moveable lens of Zielke with the fluorometer of Correa as modified by Barringer and Tokhtuev in order to control how the beam passes through the window area, whether as a collimated beam, a diverging beam over an area, moved to a different location, dependent on the type of measurement needed.

8. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458), Tokhtuev et al. (WO 03/023379) and Kolber et al. (US 6121053) as applied to claim 24 above, and further in view of f Michael (US 4005605).

Re claim 34: Correa as modified by Barringer, Tokhtuev and Kolber teaches a fluorometer (Correa, fig. 2, 4, 6) for detecting the level of fluorescent material in a body of water (col. 7, lines 45-49), the fluorometer comprising: an excitation system (Correa,

76) including an excitation source for producing excitation light capable of causing fluorescence in fluorescent material (abstract); and a detection system (106, 212, 222, 224, fig. 4 and 6) for detecting said fluorescence (Correa, col. 7, lines 45-49), wherein said excitation system comprises an excitation source comprising one or more laser (see fig. 4 and 6), the excitation system further comprising means to cause said excitation light to form, in use, a generally conical divergent beam projecting from the fluorometer (see fig. 6) and the excitation system uses a reflection surface (102), said beam causing means comprising at least one collimating lens (172) said excitation system further including means for modulating (170) said beam with a modulating signal having a modulating frequency (Correa, col. 10, lines 31-46). Correa as modified by Barringer, Tokhtuev and Kolber does not teach wherein the reflecting element slideable. Michael teaches a detection system (fig. 2 and 3) wherein at least one reflecting surface is slidably moveable towards and away from the window of the housing in which it is located (Michael, see fig. 3, the mirror is tilted toward the window). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the slideable mirror in Michael with the optical system of Correa as modified by Barringer, Tokhtuev and Kolber in order to have greater control of where the beams of fluorescence are being sent, to ensure all the fluorescence is detected by the detector providing for more accurate measurements.

9. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Correa et al. (US 4394573) as modified by Barringer (US 4517458) and Tokhtuev et al. (WO 03/023379) as applied to claim 44 above, and further in view of Geiger (US 5947051).

Re claim 37: Correa as modified by Barringer and Tokhtuev a fluorometer, provided on an underwater vehicle (Correa, see fig. 1) and wherein the vehicle includes at least one first moveable structure (10), the fluorometer being carried by a second moveable structure (), wherein said at least one first moveable structure and said second moveable structure (14) are coupled electrically and/or mechanically so that the movement of the second structure is synchronised with the movement of said at least one first structure (see fig. 1 the structures are connected and move with each other). Correa as modified by Barringer and Tokhtuev does not teach the first moveable structure for carrying, during use, a camera or lamp. Geiger teaches a vehicle (Geiger fig. 24), wherein the vehicle includes at least one first moveable structure for carrying, during use, a camera (Geiger, 36) or lamp, the fluorometer (197 and 198) being carried by a second moveable structure, wherein said at least one first moveable structure and said second moveable structure are coupled electrically and/or mechanically so that the movement of the second structure is synchronized with the movement of said at least one first structure (Geiger, 56 is a robotic arm between the two structure holding the fluorometer 197 and 198 and the camera 36). It would have been obvious to have the first structure hold a camera or lamp so as in Geiger with the fluorometer of Correa as modified by Barringer and Tokhtuev in order to be able to guide the second structure

with respect to the first structure so that the fluorometer can be used to detect and send information about the water below the first structure.

Response to Arguments

10. Applicant's arguments with respect to claims 1, 4-6, 8, 9, 12, 16, 18, 20-35, 37, 39-45 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER BENNETT whose telephone number is

(571)270-3419. The examiner can normally be reached on Monday - Friday 0730 - 1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B./

/Georgia Y Epps/
Supervisory Patent Examiner, Art Unit 2878